

CLAIMS

What is claimed is:

1. A fibrous protein-immobilization system composition comprising:
 - 5 a fiber comprising fiber-forming material; and
 - a protein attached to said fiber-forming material.
2. The fibrous protein-immobilization system composition, as set forth in claim 1, wherein said fiber is a nanofiber.
 - 10 3. The fibrous protein-immobilization system composition, as set forth in claim 1, wherein said fiber-forming materials are linear polymers selected from the group consisting of homopolymers and copolymers of α -olefins, α,β -ethylenically unsaturated carboxylic acids, vinyl aromatics, ethyl ethers, and combinations thereof.
 - 15 4. The fibrous protein-immobilization system composition, as set forth in claim 1, wherein said protein is attached directly to said fiber-forming material.
- 20 5. The fibrous protein-immobilization system composition, as set forth in claim 4, wherein said protein includes at least one functional group that can react with a corresponding function group on said fiber-forming material.
- 25 6. The fibrous protein-immobilization system composition, as set forth in claim 1, wherein said protein is attached indirectly to said fiber-forming material by an inert coupling agent.
- 30 7. The fibrous protein-immobilization system composition, as set forth in claim 6, wherein said protein includes at least one functional group that can react with a corresponding functional group on said inert coupling agent
8. The fibrous protein-immobilization system composition, as set forth in claim

1, wherein said protein is a natural or synthetic protein.

9. The fibrous protein-immobilization system composition, as set forth in claim 8, wherein said protein is selected from the group consisting of enzymes, 5 hormones, toxins, antibodies, antigens, lectins, structural proteins, signal proteins, transport proteins, receptors, and blood factors.

10. The fibrous protein-immobilization system composition, as set forth in claim 1, wherein said protein is an enzyme selected from the group consisting of 10 chymotrypsin, cytochrome C, trypsin, subtilisin, horseradish peroxidase, soybean peroxidase, and glucose oxidase.

11. A method for synthesizing a fibrous protein-immobilization system comprising the steps of:

15 synthesizing a fiber comprising a fiber-forming material; and
 attaching a protein to said fiber-forming material.

12. The method of claim 11, wherein said protein is attached to said fiber-forming material before said fiber-forming material is synthesized into a fiber.

20 13. The method of claim 11, wherein said protein is attached to said fiber-forming material after said fiber-forming material is synthesized into a fiber.

25 14. The method of claim 11, wherein said step of synthesizing includes electrospinning a solution of said fiber-forming material to produce said fiber.

15. The method of claim 11, wherein the step of attaching includes attaching said protein to a coupling agent and said coupling agent to said fiber-forming material.

30 16. The method of claim 11, wherein said protein is an enzyme and further comprises the step of attaching a cofactor to said fiber-forming material.

17. The method of claim 16, further comprising the step of presenting said enzyme to said cofactor by incorporating said enzyme into a fluid that contacts said cofactor.